

Patent Claims:

1. Hydraulic unit for slip-controlled brake systems,
including an accommodating member accommodating inlet and
outlet valves in several valve-accommodating bores of a
first and second row of valves that open into a first
housing surface of the accommodating member which is
positioned at an angle relative to a second housing
surface, opening into whose area are preferably several
braking pressure generator ports and/or wheel brake ports,
including a pump-accommodating bore arranged in the
accommodating member and aligned transversely to the
direction the valve-accommodating bores open into the
accommodating member, wherein the pump-accommodating bore
is arranged between the axes of the valve-accommodating
bores of the first and second row of valves,
including a motor-accommodating bore arranged in the
accommodating member and pointing to the pump-
accommodating bore,
including an accumulator-accommodating bore opening into
the accommodating member transversely to the axes of the
valve-accommodating bores in a third housing surface that
is opposite to the second housing surface,
including outlet valves arranged in the valve-
accommodating bores of the second row of valves, wherein
in the second row of valves the axes of the valve-
accommodating bores between the accumulator-accommodating
bore and the pump-accommodating bore point into the
accommodating member, and including several channels
interconnecting the valve-, pump- and accumulator-
accommodating bores and being able to provide a hydraulic

connection between a braking pressure generator and several wheel brakes,

c h a r a c t e r i z e d in that a third row of valves (Z) is arranged in the accommodating member (1) between the first row of valves (X) including the valve-accommodating bores for the inlet valves and the second housing surface (A2), with the third row of valves (Z) including at least in one valve-accommodating bore (Z1) an electric change-over valve which is closed in its basic position and hydraulically linked to the pump-accommodating bore (5) by way of a portion of a suction channel (6) that traverses the first row of valves (X) for connection to the pump-accommodating bore (5).

2. Hydraulic unit as claimed in claim 1,

c h a r a c t e r i z e d in that at least one further valve-accommodating bore (Z2) of the third row of valves (Z), into which a separating valve is inserted, is connected to the valve-accommodating bore (Z1) containing the change-over valve by way of a channel (3), preferably a transverse channel.

3. Hydraulic unit as claimed in claim 2,

c h a r a c t e r i z e d in that the valve-accommodating bore (Z2) containing the separating valve is connected to an inlet channel (4) that leads to the first row of valves (X) and opens in the first row of valves (X) into the bottom of a valve-accommodating bore (X2) which is designed as a blind-end bore and receives an inlet valve.

4. Hydraulic unit as claimed in claim 3,
c h a r a c t e r i z e d in that the inlet channel (4) is continued along the first row of valves (X) in the direction of a noise damping chamber (7) that opens directly adjacent to the pump-accommodating bore (5) into a fourth housing surface (A4) into which also the pump-accommodating bore (5) extends.
5. Hydraulic unit as claimed in claim 4,
c h a r a c t e r i z e d in that a pressure channel (8) extends radially through the pump-accommodating bore (5) at the outside end of the pump-accommodating bore (5) in the direction of the noise damping chamber (7), for what purpose the pressure channel (8) is designed preferably as a transverse channel which opens radially into a blind-end bore provided for the noise damping chamber (7).
6. Hydraulic unit as claimed in claim 1,
c h a r a c t e r i z e d in that the pump-accommodating bore (5) is penetrated by the suction channel (6) in the direction of the accumulator-accommodating bore (9), with the suction channel (6) opening into the bottom of the accumulator-accommodating bore (9).
7. Hydraulic unit as claimed in claim 6,
c h a r a c t e r i z e d in that a non-return valve opening in the direction of the pump-accommodating bore (5) is inserted into the portion of the suction channel (6) which is positioned between the pump-accommodating bore (5) and the accumulator-accommodating bore (9).

8. Hydraulic unit as claimed in claim 6,
c h a r a c t e r i z e d in that a return channel (10) opens into the bottom of the accumulator-accommodating bore (9), said channel being connected at least to one of the valve-accommodating bores (Y2) accommodating the outlet valves and arranged directly adjacent to the accumulator-accommodating bore (9) in the second row of valves (Y).
9. Hydraulic unit as claimed in claim 8,
c h a r a c t e r i z e d in that each valve-accommodating bore (Y1, Y2) of the second row of valves (Y) is configured as a blind-end bore, at the bottom of which a return channel (10) leading to the accumulator-accommodating bore (9) is connected.
10. Hydraulic unit as claimed in claim 9,
c h a r a c t e r i z e d in that the return channel (10) extends past the pump-accommodating bore (5) in each case radially or tangentially through the valve-accommodating bore (Y2) arranged in the second row of valves (Y) to the valve-accommodating bore (X2), which is arranged in the first row of valves (X) and connected to the wheel brake port (R2) arranged beside and above the third row of valves (Z) by means of a wheel pressure channel (11) led past the third row of valves (Z).
11. Hydraulic unit as claimed in claim 10,
c h a r a c t e r i z e d in that a portion of the return channel (10) extends radially or tangentially through the valve-accommodating bore (Y2) arranged in the second row of valves (Y), past the accumulator-accommodating bore (9) to the third housing surface (A3),

and a pressure sensor accommodating bore (W2) is connected to this portion of the return channel (10).

12. Hydraulic unit as claimed in claim 1,
c h a r a c t e r i z e d in that adjacent to the valve-accommodating bore (Z1) provided for the change-over valve, a blind-end bore is provided in the accommodating member (1) to accommodate a pump suction damper (12), said blind-end bore being connected by way of a pressure channel (13) to the valve-accommodating bore (Z1) receiving the change-over valve.

Abstract:

Hydraulic Unit for Slip-Controlled Brake Systems

The present invention relates to a hydraulic unit for slip-controlled brake systems which includes a third row of valves (Z) in the accommodating member (1) between a first row of valves (X) having the valve-accommodating bores (X1-X4) for the inlet valves and the second housing surface (A2), wherein the third row of valves (Z) includes at least in one valve-accommodating bore (Z1) an electric change-over valve which is closed in its basic position and hydraulically linked to the pump-accommodating bore (5) by way of a portion of a suction channel (6) that traverses the first row of valves (X) for connection to the pump-accommodating bore (5).

Figure 1